

# Mid-Year Small Area Population Estimates for Scotland: Methodology Guide



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# 1. Introduction to small area population estimates

This paper describes the current methodology used by National Records of Scotland (NRS) to produce the annual mid-year small area population estimates, with reference to the latest small area population estimates based on the 2011 Census.

The most authoritative population estimates come from the census, which takes place every 10 years. The most recent census in Scotland was held in March 2011. Population estimates from the census are updated each year with elements of population change in the previous 12 months to produce the annual mid-year estimates. These are considered the official estimates of the Scottish population.

## 1.1. Coverage and availability of population estimates

### Coverage

The latest [Population Estimates](#) can be found on the NRS website. The available estimates are split under three sections:

#### 1. Mid-year population estimates

The latest annual mid-year population estimates for Scotland and its constituent NHS Board and council areas. This section also includes historical data back to 1982 and a time series dataset back to 1855.

#### 2. Special area population estimates

This section contains the Small Area Population Estimates for both 2001 and 2011 Data Zone geographies and estimates for Settlements and Localities. Population estimates for Scottish Parliamentary Constituencies, Westminster Parliamentary Constituencies, Nomenclature of Units for Territorial Statistics (NUTS), Scottish Index of Multiple Deprivation (SIMD) deciles and Urban/Rural classification categories can also be found here.

#### 3. Estimates of special populations

Estimates of the population split by country of birth, nationality and estimates of the very old (including centenarians) are available here. Following consultation with users, estimates of population by marital status are no longer produced.

### Availability

Population estimates for Scotland, council and NHS Board areas for mid-year (as at 30 June) normally become available around 10 months after the reference date. These estimates are followed by:

- Small Area Population Estimates (SAPE) at data zone level
- Mid-year population estimates for those aged 90 and over
- Population by Country of Birth and Nationality
- Population Estimates for Settlements and Localities in Scotland

Published estimates split by sex for all ages are rounded to the nearest 10 at council area level to avoid implying spurious accuracy and for ease of aggregation.

Data sets may be downloaded free of charge in Portable Document Format (PDF), Excel or Comma Separated Value (CSV) format. Other data not published on the web may be available on request, for example historic estimates<sup>1</sup>.

## 1.2. Uses of small area population estimates

Mid-year small area population estimates currently have a wide variety of uses within central government, as well as being used by local authorities and health bodies, other public bodies, commercial companies and individuals in the private and academic sector. These uses can be categorised into two broad groups:

- where the absolute numbers are of key importance. This may be in terms of allocating financial resources from central government, planning services or grossing up survey results. Some of the main central government uses are concerned with resource allocation, and
- where the population figures are compared with other figures such as the numbers of births or deaths in the calculation of rates and ratios.

## 1.3. Definition of the population

The small area population estimates for mid-2011 onwards are based on the 2011 Census and 2011 Data Zone boundaries and relate to the usually resident population. In simple terms, this means that population estimates are estimates of people where they usually live. The usually resident population does not always coincide with the number of persons to be found in an area at a particular time of the day or year. The daytime populations of cities and the summertime populations of holiday resorts will normally be larger than their usually resident populations.

The population base from the 2011 Census underpins the mid-year small area population estimates resident base and is defined as follows:

The 2011 Census has been conducted on a resident basis. This means the statistics relate to where people usually live, as opposed to where they are on census night. Students and schoolchildren studying away from home are counted as a resident at their term-time address. If a member of the armed forces did not have a permanent or family address at which they are usually resident, they were recorded as usually resident at their base address. As in 1991 and 2001, residents absent from home on census night were required to be included on the census form at their usual/resident address. Wholly absent households were legally required to complete a census form on their return. No information is provided on people present but not usually resident.

For most people, defining where they 'usually' live for the purposes of the census is quite straightforward. However for a minority of people the concept of 'usual residence' is more difficult and it may be difficult to apply a general rule to assign people to where they are 'usually' living. Groups included in this category are:

- students;

### Footnote

1) Contact details can be found in [Section 5](#) of this publication.

- armed forces;
- prisoners;
- seasonal workers;
- contract workers and others who frequently move with their job;
- some people living in communal establishments;
- people sleeping rough;
- foreign students and au pairs;
- people with frequently used second homes in the UK or abroad;
- people who live and work away from a family home for part of the week;
- children who regularly move between a mother and father's home;
- adults who live with a partner for part of the time but maintain a separate residence; and
- any other groups of people with more than one residence.

The usual residence for students and certain members of the armed forces is specifically referred to in the definition of resident population for the 2011 Census given above. For other groups, guidance was provided either on the census form or in the enumerators' instructions.

In general, the definitions used in the 2011 Census are carried through into the population estimates, mainly because the census is used as a base for the population estimates. However, although efforts are made to ensure comparability of definitions in intercensal data and sources used in the population estimates, sometimes it is not possible to obtain data using the same definition as used in the census.

For example, in the International Passenger Survey (IPS), used to estimate international migration, a person is defined as an in-migrant and therefore a resident if they are intending to stay in Scotland for at least 12 months. However in the census, NRS made no specific adjustment for the presence of 6-12 months migrants among the persons counted in the census.

More details on the scale of the difference in population count between the enumeration and main output base in Scotland is given in [Paper 9 11\(09\)](#) of the Population and Migration Statistics Committee (PAMS) meeting held on 21 January 2011 (more details available on the NRS website).

In practice, when compiling a population estimate, a number of data sources have to be used, each with its own definition of usual residence. These differences in definition are becoming increasingly important, and are the subject of constant research within NRS and the Office for National Statistics (ONS).

## 1.4. Other population products

### National population projections

The ONS produces national population projections for the UK and on behalf of its constituent countries. The projections by age and sex are normally produced every second

year and the assumptions on which they are based are agreed in consultation with the statistical offices of England, Scotland, Wales and Northern Ireland. The primary purpose of the projections is to provide an indication of future population if current trends in fertility, mortality and migration continue into the future. They are used as a common framework for national planning in a number of different fields. Further information is available on the [Population Projections](#) section of the ONS website.

## **Sub-national population projections**

Sub-national population projections for areas within Scotland are produced by NRS and give an indication of future trends in population by age and sex over the next 25 years. They are trend-based projections, which mean assumptions for future levels of births, deaths and migration are based on observed levels over the previous five years. They show what the population will be if recent trends in these continue and also show variant projections based on a range of plausible scenarios e.g. high migration, low fertility. The projections do not take into account any future changes that may occur as a result of policy initiatives, social or economic change. They are constrained at a national level by the national projections produced by ONS. Further information and data on [sub-national projections](#) is available on the NRS website.

## **Migration statistics**

NRS produce mid-year to mid-year estimates of migration within Scotland, between Scotland and England, Wales and Northern Ireland and between Scotland and overseas. More information is available in the [Migration section](#) of the NRS website.

## **Household estimates and projections**

NRS produces estimates and projections of the numbers of households in Scotland. The household projections are based on the population projections and observed trends in household size. The latest household estimates and household projections can be found in the [Households section](#) of the NRS website.

## **Other outputs**

NRS also produces a range of other outputs and more information can be found in the [Statistics section](#) of the NRS website.

## 2. Methodology for producing small area population estimates

### 2.1. Introduction

Small area population estimates for Scotland and other areas are made using the **cohort component method**. This is a standard demographic method and is used by several other national statistics institutions that also have access to high quality data sources for the components of population change.

Mid-year small area population estimates relate to the population resident on 30 June of the reference year. The starting point for the estimates is the resident population on 30 June in the previous year.

This population, by single year of age, is then aged on by one year (for example all four-year-olds become five-year-olds one year later). Those who have been born during the 12 month period prior to the mid-year point are then added on to the population and all those who have died during the 12 month period are removed according to their age, sex, and their usual place of residence.

The other factor to be taken into account in estimating the small area population is the movement of people in and out of Scotland from the rest of the UK and from overseas (international migration). Internal migration includes both cross-border moves between the four constituent countries of the UK, which affect the total Scottish population and moves between data zones within Scotland. Movements of people within Scotland, including changes in special populations (such as the Armed Forces and prison population) contribute to population change at data zone level.

Migration is the most difficult part of the population estimate process to estimate precisely, as migratory moves are not registered in the UK, either at the national or local level. The best proxy data available on a consistent basis are used to estimate migration.

### 2.2. Summary of the cohort component method

The cohort component method can be summarised as follows:

- Start with the previous mid-year resident population and age-on by one year.
- Estimate the population change between 1 July and 30 June by:
  - Adding births occurring during the year;
  - Removing deaths occurring during the year;
  - Allowing for migration to and from the area.

Adjustments are also made for some special population groups that are not captured by the internal or international migration estimates: members of the armed forces and prisoners. These populations have specific age structures, which remain fairly constant over time. Therefore these groups are not aged-on with the rest of the population. Such populations are referred to as 'static populations'.

### 2.3. Quality assuring the data

When the Population and Migration Statistics team within NRS receives data for the various components, checks are carried out and comparisons made with previous years' data to gauge consistency and completeness of coverage. The data are then processed

electronically to produce the population estimates. Quality assurance takes place at each stage of this process, as well as on the data before being used in the population estimates.

More information on the quality assurance of administrative data used in the population estimates can be found in the [quality section](#) of the NRS website.

## 2.4. The order of production

Population estimates for Scotland, council and NHS Board areas are produced first. Estimates for small areas (2011 Data Zones) are produced in the same way and constrained to the council area estimates. Data zones are designed to nest into council areas although for the boundary changes may mean their borders may no longer align precisely. Data zone population estimates are aggregated to create population estimates for various geographies e.g. urban and rural populations or feed into the calculation of settlement and locality population estimates on a 'best-fit' basis.

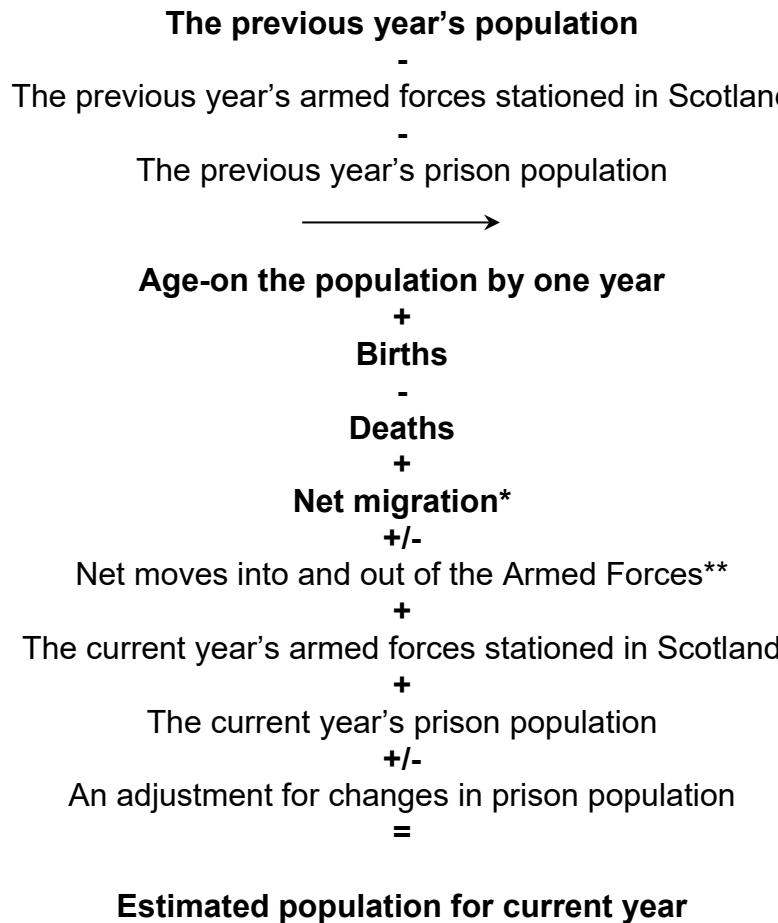
Information on populations calculated by aggregating population estimates to various geographies on a 'best fit' basis can be found in the [Evaluation of Non Standard Geography Population Estimates](#) section of the NRS website.

## 2.5. Overview of the method

The following figure shows how the population estimates are produced. All of these processes are carried out by single year of age and sex up to age 89. Those aged 90 and over are processed as a single group. The population estimates are processed by the following steps:

1. The first step is to remove all 'static populations' (populations with relatively static age structures). Therefore, all armed forces stationed in Scotland and detained prisoners from the previous year are removed from the previous year's population.
2. The resident population is then aged on by one year the previous year's resident population.
3. The main components of change – birth, deaths and net migration - are applied. There are three types of migration: migration within Scotland, migration to and from the rest of the UK, migration to and from the rest of the world.
4. The prison and armed forces populations for the latest reference date are added and a small adjustment is made for changes in the prison population and moves to and from the armed forces.
5. When applying population change at small levels of geography, some data zones may have negative population estimates at certain ages. Any large negatives (-6 or less) are reset back to the previous years' value and those between -5 and -1 are set to zero. Some small manual adjustments are made to the population, for example, the age distribution in student areas.

6. The estimates are then constrained to the mid-year population estimates at council area level again resulting in the population estimates for Scotland and each data zone by sex and age.



\* Net migration includes in-migrants and out-migrants from England & Wales, Northern Ireland and overseas, including estimates of asylum seekers and refugees. For Council, NHS Board areas and 2011 Data Zones this also includes moves within Scotland.

\*\* Movements to and from the armed forces (including dependents) are processed with, and previously were included under, net migration.

## 2.6. Births

Data on births are obtained from the compulsory civil registration system administered by NRS and the Local Registration Offices. Counts of live births by sex for the period from 1 July of the previous year to 30 June of the current year are supplied. Because registration of a birth may legally take place up to 21 days after the birth, the data received refer to the date of birth rather than the date of registration. Births are added to the population at age zero and are allocated to the area of usual residence of the mother.

A number of births to patients who are not residents of Scotland are registered to data zones which contain hospitals. For example, some patients whose usual residence is in England give birth at the Borders General Hospital (data zone S01012377). As this would result in an inflated population in this data zone, a manual adjustment is used to take account of this. Births to patients who are not usually resident in Scotland are randomly allocated to other data zones within the council area. It is assumed that the number of non-resident births registered in Scotland is the same as the number of resident births not registered in Scotland.

## 2.7. Deaths

As for births, numbers of deaths are obtained from the compulsory civil registration system. Counts of deaths by age and sex for the period from 1 July of the previous year to 30 June of the current year is supplied. Data refer to the date of death rather than the date that the death was registered. Deaths are subtracted from the mid-year population by age and sex at the area of usual residence of the deceased. In order to obtain the population at mid-year, the age at death is calculated to be the age that the deceased person would have been on 30 June. This age calculation is carried out by the NRS Vital Events team. As with births, an adjustment is made for non-resident deaths which have occurred in Scotland.

## 2.8. Migration

Migration is the most difficult component of population change to estimate, as there is no comprehensive system which registers migration in the UK, either moves to or from the rest of the world, or moves within the UK. Estimates of migration are therefore based on survey data and the best proxy data that exists.

Migration estimates are derived from three key sources of data:

- National Health Service Central Register (NHSCR);
- Community Health Index (CHI); and
- International Passenger Survey (IPS).

Anonymised data from the CHI is used to calculate moves between data zones. The IPS provides information on overseas moves into and out of Scotland. These data sources are described in more detail in section 3.

## 2.9. Armed forces

The armed forces population used in the mid-year estimates is based on armed forces personnel recorded in the census, which captures a larger armed forces population than administrative sources. Census estimates for local areas were adjusted to take into account differences in where armed forces personnel were instructed to complete their census forms and our standard definition of 'usual residence'.

To update the population each year, administrative data from Defence Statistics (part of the Ministry of Defence) is used to estimate numbers residing in each council and NHS Board area. The data zone armed forces population is calculated by controlling to the council area totals.

Until mid-2016 the age-sex distribution of the armed forces population was based on data from the 2011 Census. However, from mid-2017 data by single year of age and sex is now sent to NRS by Defence Statistics.

Changes in the armed forces populations from the previous year's Defence Statistics data are calculated by single year of age and sex for each council area. The changes are then applied to the armed forces data derived from the census. This is done rather than using the new data from Defence Statistics directly due to the differences between the armed forces captured by the census and administrative estimates.

## **2.10. Prisoners**

Information on those sentenced to six months or more at 30 June by age, sex and establishment is obtained from the Scottish Government prison statistics. This group of prisoners are considered to be 'usually resident' in the area where the prison is located. Prisoners with shorter sentences are assumed to be 'usually resident' at their home address.

At the beginning of the mid-year processing the prison population of the previous year is removed from the previous year's population. After ageing on the general population and adjusting for births, deaths and migration the prison population for the current year is added to the population.

Following this, an adjustment has been introduced from 2011 to account for any changes in the prison population. For example, if the prison population increased by 200 people in the year, the national population would be adjusted downwards by the same amount. This prevents double counting of prisoners and prevents an increase in the national population, which would otherwise result from any increase in the prison population.

## **2.11. Procedures during census years**

The method above describes how small area population estimates are calculated for years when there is no census. For census years such as 2011, a slightly different approach is necessary. The starting point for the base population is that estimated by the census. In 2011 this was as at 27 March. Rather than ageing on the population by one year, the population is aged on by the period of time between the census and 30 June (three months in 2011) which is calculated using dates of birth provided on the census. Similarly, the components of change only account for change during this period rather than a whole year.

In 2011, an adjustment was made to the initial census base population used for the mid-year estimates. This was to account for difference in where armed forces personnel were instructed to complete their census forms and our standard definition of 'usual residence'. The adjustment largely increased numbers in areas with barracks and correspondingly decreased numbers elsewhere in the country compared with the census population. The mid-2011 population assumed no changes in the total number of personnel between 27 March and 30 June.

### 3. Detail on the methodology for estimating migration

#### 3.1. Internal migration within the UK

The NHSCR system records the movements of patients between NHS Board areas in Scotland, whereas the movements for patients in England and Wales are recorded in the Personal Demographic Service (PDS). The PDS holds the master demographics database for the NHS in England and Wales. Each time a patient transfers to a new NHS doctor in a different NHS Board area, the NHSCR and PDS are notified and then the patient is considered to have made a migrant move. Counts of these re-registrations are used as a proxy indicator for moves between Scotland and the rest of the UK.

The CHI holds records of people registered with an NHS doctor in Scotland. Unlike the NHSCR, the records provided to NRS contain the postcodes of the patient's address, which enables migration to be estimated for council areas, and for smaller areas. Estimating council area migration involves matching CHI patient records extracted from the database which reflects the 'live' CHI system on two occasions one year apart.

Currently, NRS migration data derived from the NHSCR is considered to be the most reliable data available at NHS Board area level, so estimates from the CHI are controlled to ensure that they are consistent with the NHSCR data for moves across NHS Board area boundaries by origin, destination, age and sex.

Due to an improvement in data sources, the accuracy of cross border migration data between Scotland and Northern Ireland was improved in 2009. More information on the nature of the improvements is contained in the papers from the May 2010 meeting of the [PAMS Committee](#), available on the NRS website. We are continuing to review the process for estimating internal migration, including investigating the use of patients' postcode information held on the NHSCR. More information on the progress of this work can be found in papers of the [PAMS Committee](#).

Until 2016 NHS patient movements in England and Wales were recorded in the NHSCR, however this system was switched off in February 2016. Since that time the PDS holds the master demographic database for the NHS England and Wales. The PDS data is supplied to ONS and postcode changes are seen as representing moves of address. More information is available in the [Methodology Guide for the Mid-2016 Estimates](#) on the ONS website.

Unlike the NHSCR data provided previously, the PDS file contains administrative/system changes as well as actual moves. There is currently no variable available that distinguishes between actual moves and system updates. Also the PDS updates file for 2017 contains moves that occurred in previous years. In order to produce plausible cross border flows for 2017, it was necessary to make assumptions about which records to extract from the PDS that made it more consistent with the data extracted from the NHSCR previously. The main assumptions were:

- For records matching on key variables only the latest record was kept.
- The 2017 PDS updates file was merged with the 2016 PDS stocks file, the assumption being that if an individual has already moved from Scotland to England and Wales by 30 June 2016 (according to the 2016 stocks file) then we do not

consider they have moved again in 2017 if the posting effective date and other key variables have not changed.

### 3.2. International migration

An international migrant is defined by the United Nations as someone who changes country of residence for 12 months or more. There is no single, all inclusive system in place to measure all movements of people into and out of the UK or to determine if they meet the definition of a long-term migrant. Therefore, it is necessary to use a combination of data from different sources that have different characteristics and attributes in order to produce estimates of international migration. While offering the best data currently available, none of the data sources used are specifically designed to capture information solely on international migration.

Prior to mid-2020, NRS used the Long-Term International Migration (LTIM) estimates produced by the ONS as the estimate of international migration to and from Scotland.

Three sources of data are used by ONS to compile the LTIM estimates:

- International Passenger Survey (IPS);
- Information held by the Home Office; and
- Labour Force Survey (LFS).

The IPS is a continuous sample survey conducted by the ONS at the principal air, sea and Channel Tunnel routes between the UK and countries outside the British Isles. It is the prime source of migration data to and from the UK, providing estimates of both inflows and outflows, but does not cover all migration types. The Home Office provides data on refugees and on asylum seekers and their dependants, and the LFS, collects information on where international migrants live based on their recorded work address.

Over time changes have been made to the IPS sample design, to make the survey more focused on identifying migrants. These changes included a re-organisation of the times and frequency of sampling of travellers, sampling at additional locations which means that the IPS now includes Edinburgh, Glasgow and Aberdeen airports, and improvements to the IPS weighting methodology.

Given that the IPS collects information on the intentions of potential migrants, which may or may not be realised, an adjustment is made to the IPS data for visitor switchers (people who say they are staying for less than 12 months but in fact stay more) and migrant switchers (people who say they are staying for longer than 12 months but in fact stay for less).

The IPS provides an estimate of international migrants into the United Kingdom. The allocation of these migrants to Scotland is based on the LFS. The LFS provides more reliable data on the geographical distribution of immigrants than the destination provided in the IPS as it is based on where migrants actually live rather than on their initial intentions. The outflow of international migrants from Scotland is based directly on the IPS data. More information on the LTIM method including the quality of the IPS can be found in the [International Migration](#) Methodology section of the ONS website.

In March 2020, the IPS was suspended due to the COVID-19 pandemic. The Office for National Statistics led research into alternative data sources including [using statistical modelling to estimate UK international migration](#) over this period. For the year ending June 2020, overseas migration for Scotland was estimated by the following:

- **July 2019 to February 2020:** Estimate migration flows based on the established method using IPS data.
- **March to June 2020:** Migration flows estimated based on the Scottish proportion of UK [modelled migration](#). The Scottish proportion was calculated based on the Scottish proportion of flows from July 2019 to February 2020.
- **Year to June 2020:** Include data on asylum seekers and refugees for the full year.

### 3.3. Distribution of international migrants to and from Scotland

International flows between Scotland and overseas flows are allocated to each NHS Board area. The age and sex distribution of international migration is assumed using proportions recorded on the NHSCR. These proportions are applied to the total overseas flows for Scotland.

#### Inflows from overseas

Moves from overseas to Scottish NHS Board areas registered on the NHSCR are used to estimate the proportion of migrants entering each area.

For inflows from overseas, the age-sex distribution of moves from overseas to that NHS Board area on the NHSCR is used.

#### Outflows to overseas

Patients do not reliably de-register with their doctor when moving overseas. Therefore, the NHSCR records hold limited data on international outflows from NHS Board areas to overseas. As a result, various methods have been used to approximate the geographic distribution of out-migrants since 2001. We recently reviewed the current method and found that it still provides the best approach for estimating the age and sex distribution of international outflows from each NHS Board area given data sources available.

International outflows are allocated to NHS Board areas based on:

- international inflows from two years prior to the reference date;
- outflows to the rest of the UK; and
- the population share of each NHS Board area.

These proportions are averaged but with international inflows weighted twice. The international inflows stand as a proxy for non-British out-migrants (e.g. 'returning home') while the moves to the rest of the UK and population share stand as a proxy for British out-migrants.

For international out-migrants the age-sex distribution is based on:

- out-migrants to the rest of the UK leaving from that NHS Board area; and
- in-migrants from overseas two years prior to the reference date, aged on by two years.

At NHS Board area level the weighting of the two distributions depends on the level of in-migration from overseas that takes place in that area. Areas with a high level of in-migration from overseas are assumed to also have out-migrants who reflect the characteristics of this group (e.g. 'returning home').

## **Adjustments**

It is acknowledged that NHSCR flows undercount the number of migratory moves for young men in particular, due to General Practitioner (GP) registration behaviour in different groups. Compared with LTIM estimates by sex there are fewer men in both the in and out-migrant groups recorded on the NHSCR. A sex-ratio adjustment has been introduced from 2011 which increases the number of male migrants at young adult ages where there is a large majority of women seen in the NHSCR data.

More information on how the methodology has been changed is available in the papers from the April 2013 meeting of the [PAMS Committee](#) on the NRS website.

This method was improved for mid-2017 population estimates. Data from the International Passenger Survey is aggregated from mid-2010 onwards to determine the size of the sex-ratio adjustment. NHSCR data from mid-2010 onwards has also been included to determine which ages to apply the adjustment to for each NHS Board area.

## **Distributing below health board level**

The distribution of migrants to council areas and data zones is based on records from the CHI, which are then made consistent with the NHSCR geographic and age/sex distributions at NHS Board area level. International in-migrants are allocated using records appearing on the CHI extract where the patient had arrived from overseas. Like the NHSCR, the CHI extract holds limited data on people leaving Scotland for overseas and so international out-migrants are allocated using a combination of in-migrants to Scotland from overseas and migrants leaving Scotland for the rest of the UK.

More information on how the CHI extract is used in the mid-year estimates (and subsequently the small area mid-year estimate) process and more detail of the methodology is available in the meetings papers PAMS (03) 10 – Improving the GROS migration data for council areas – proposals for 2002 and Supplement to PAMS (03)10 – Validation of Proposed Methodology both of which can be found within the PAMS meeting [3 April 2003](#) which is available on the NRS website.

## **3.4. Asylum seekers**

Both inward and outward asylum seekers are included in the LTIM estimate. Outward asylum seekers are people who arrive looking for asylum but for one reason or another don't stay. Most of these asylum seekers are assumed to be supported by the National Asylum Support Service (NASS). This means that they are entering the UK through a Home Office application and are provided with support such as subsistence costs or help with accommodation by NASS while their application is underway.

Currently the vast majority of NASS supported asylum seekers in Scotland are supported in Glasgow City council area. Therefore, it is assumed that the majority of asylum seekers entering Scotland migrate to Glasgow City Council.

A small number of non-NASS supported asylum seekers may be present elsewhere in Scotland. No specific adjustments are made for this group.

The age/sex distribution of in-migrating and out-migrating asylum seekers is derived from the distribution at UK level provided by the ONS and information from the Home Office. Asylum seekers are distributed to Glasgow City data zones and controlled to the council level estimates by age and sex.

### 3.5. Refugees

Refugees resettled under Home Office Resettlement Schemes have been included in the population estimates since mid-2016. For the mid-2017 estimates, refugees were accounted for in a similar way to asylum seekers. They are also included in the LTIM estimate, although there are currently only inward flows of refugees. Refugees are, however, distributed much more widely across Scotland than asylum seekers.

NRS receives administrative data on the single year of age, sex and council area of refugees supported under the Syrian Vulnerable Persons Relocation Scheme (SVPRS) from the Home Office.

The majority of refugees resettled in Scotland are from the SVPRS, however, we also receive data on non-SVPRS refugees by age and sex at UK level. It is assumed that Scotland receives the same share of non-SVPRS refugees as SVPRS refugees. This share is then used to select a random sample of the non-SVPRS refugees by single year of age and sex from the UK data.

As we do not receive location data for non-SVPRS refugees, the distribution of SVPRS refugees to council areas in Scotland is used to distribute non-SVPRS refugees to council areas across Scotland. Therefore, the estimates assume council areas receive the same proportion of SVPRS and non-SVPRS refugees. Refugees are distributed to data zones within each council and controlled to the council area estimates for age and sex.

## 4. Improvements and future developments

The methodology used in the population estimates is ever-evolving and as more administrative data sources become available to NRS and as the accuracy of data increases, inevitably, changes to the methodology will result. This section outlines several new sources of data that NRS are pursuing access to and also highlights areas in the current methodology that NRS are working towards improving.

### 2019 Boundary review

On 1 April 2019, a boundary review between Glasgow City and North Lanarkshire council areas came into effect. As a result, eight postcodes were transferred from Glasgow City to North Lanarkshire. Migration estimates at council level were adjusted to include residents of this area in an additional 400 moves from Glasgow City to North Lanarkshire.

Data zone populations can be summed to their associated council level population. For this reason, the additional 400 moves had to be included in the data zone migration estimates. However, data zone boundaries are reviewed every 10 years as part of the census and the boundary of the data zone containing the transferred postcodes was not changed.

As a result, the additional 400 moves out of Glasgow City were distributed across all data zones in the council area. The same was applied for in-migration to data zones in North Lanarkshire.

### Improving the use of the NHSCR

NRS are continuing to review the process for estimating migration flows within Scotland and from the rest of the UK using a direct extract of anonymised records from the NHS Central Register (NHSCR). This should result in more accurate migration data at council and small area level.

### Transformation programme

NRS are part of a cross-government programme of work being led by the Office for National Statistics to transform population and migration statistics through greater use of administrative data.

One of the objectives of the Scotland's Census 2021 Programme is to make recommendations for future censuses. In order to feed in to this recommendation, a project to create Administrative Data Population and Household Estimates was commissioned. The aim of this project is to look at the future use of administrative data collected by public bodies and services to augment or replace NRS' data collected by a traditional census.

NRS are working to create admin-based population outputs from various sets of administrative data, and the first set of [administrative based population estimates for 2016](#) were published in November 2020. These were published as experimental statistics under the Code of Practice for Official Statistics, and allow a discussion with users about the use of administrative data within the field of demographic statistics.

As this area of statistics develops, information will be updated to the following webpage:  
<https://www.scotlandscensus.gov.uk/administrative-data>

If you have an interest in attending any future stakeholder events where administrative data is being discussed, please contact: [Scotlandscensus@nrscotland.gov.uk](mailto:Scotlandscensus@nrscotland.gov.uk)

### **New sources of data**

NRS are exploring the feasibility of using data from the Higher Education Statistics Agency (HESA) to improve estimates of student migration.

## **5. Enquiries and suggestions**

Please contact our Statistics Customer Services if you need any further information.  
Email: [statisticscustomerservices@nrscotland.gov.uk](mailto:statisticscustomerservices@nrscotland.gov.uk)

If you have comments or suggestions that would help us improve our standards of service, please contact:

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